

Serial No. 07/032,041
Reply to Office Action of 05/27/2004

Amendments to the Claims:

Please cancel claims 16-55, 59, 63-64, 66-87 and 94.

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 56-58, 60-62, 65, and 88-93 remain pending. Claims 98-99 have been added.

In the claims:

1-15 (Cancelled)

16-55 (Cancelled)

56. (Amended) A composition which is superconductive at a temperature of 70°K and higher, comprising:

a ~~sintered~~ metal oxide ~~complex~~ of the formula



wherein;

"L" is ~~scandium~~, yttrium, lanthanum, ~~cerium~~, ~~praseodymium~~, neodymium, samarium, europium, gadolinium, ~~terbium~~, dysprosium, holmium, erbium, thulium, ytterbium, lutetium, or mixtures thereof; "M" is barium, strontium, ~~calcium~~, ~~magnesium~~, ~~mercury~~, or mixtures thereof; "A" is copper, ~~bismuth~~, ~~tungsten~~, ~~zirconium~~, ~~tantalum~~, ~~niobium~~, ~~vanadium~~; "x" is from about 0.65 to 0.80; "a" is 1; "b" is 1; and "y" is a value from about 2 to about 4 that provides the metal oxide ~~complex~~ with zero electrical resistance at a temperature of 70°K or above.

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57. (Amended) The superconducting composition of claim 56, wherein "M" is barium ~~or strontium and "A" is copper.~~

58. (Previously presented) The superconducting composition of claim 57, wherein "x" is about 0.667.

59. (Cancelled)

60. (Amended) The superconducting composition of claim ~~59~~ 58, wherein "L" is yttrium, lanthanum neodymium, samarium, europium, gadolinium, erbium or lutetium.

61. (Amended) The superconducting composition of claim 56, wherein the metal oxide complex has the formula



and ∂ is a number value from about 0.1 to about ~~4.5~~ 1.0 that provides the oxide complex with zero electrical resistance at a temperature of 70°K or above.

62. (Amended) The superconducting composition of claim 61, wherein "M" is barium ~~or strontium, "A" is copper.~~

63. (Cancelled)

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64 (Cancelled)

65. (Amended) The superconducting composition of claim 64 62, wherein "L" is yttrium, lanthanum, neodymium, samarium, europium, gadolinium, erbium or lutetium and ~~"M"~~ is ~~barium~~.

66-87 (Cancelled)

88. (Amended) A method for making a superconducting metal oxide ~~complex~~, comprising the steps of:

mixing solid compounds containing L, M, A and O in amounts appropriate to yield the formula $[L_{1-x}M_x]_aA_bO_y$ wherein "L" is ~~scandium~~, yttrium, lanthanum, ~~cerium~~, ~~praseodymium~~, neodymium, samarium, europium, gadolinium, ~~terbium~~, dysprosium, ~~holmium~~, holmium, erbium, thulium, ytterbium, lutetium, or a combination thereof; "M" is barium, strontium, ~~calcium~~, ~~magnesium~~, ~~mercury~~ or a combination thereof; "A" is copper, ~~bismuth~~, ~~titanium~~, ~~tungsten~~, ~~zirconium~~, ~~tantalum~~, ~~niobium~~, ~~vanadium~~ or a ~~combination thereof~~; "a" is 1 to 2; "b" is 1; "x" is about 0.01 to about 1.0; and "y" is a value from about 2 to about 4 that provides the metal oxide ~~complex~~ with zero electrical resistance at a temperature of 40°K or above;

compacting the mixture into a solid mass by application of pressure from about 100 to about 30,000 psi;

heating the solid mass in air to a temperature of from about 800 to about 1000°C for a time sufficient to react the compacted mixture in the solid state; and

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quenching the solid mass to ambient temperature in air.

89. (Amended) The method of claim 88, wherein "M" is barium or strontium and "A" is copper.

90. (Previously presented) The method of claim 89, wherein "x" is about 0.65 to about 0.80 and "a" is 1.

91. (Previously presented) The method of claim 90, wherein the mixture is compacted to a solid mass by application of pressure of from about 100 to about 500 psi.

92. (Previously presented) The method of claim 91, wherein the solid mass is heated under a reduced oxygen atmosphere of about 2000 μ at a temperature of from about 820°C to about 950°C.

93. (Amended) A material containing a sufficient quantity of a superconductive crystalline phase to cause the material to exhibit substantially zero electrical resistance at a temperature of 77°K or above; said crystalline phase composition having the formula $LM_2Cu_3O_{6+\delta}$, wherein "L" is Se, Y, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, or mixtures thereof; "M" is Ba, Sr or mixtures thereof; and δ is a value from about 0.1 to about 4.5 that provides the composition with zero electrical resistance at a temperature of 77°K or above.

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94. (Cancelled)

95-97 (Not entered)

98. (New) The material of claim 93 wherein L is Y and M is Ba.

99. (New) The material of claim 93 wherein L is, Sm, Eu, Gd, Er, or Lu and M is Ba.